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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/702,368	11/06/2003	William F. DiVergilio	02-IMP-068	8501
29393 7590 08/23/2007 ESCHWEILER & ASSOCIATES, LLC NATIONAL CITY BANK BUILDING 629 EUCLID AVE., SUITE 1000 CLEVELAND, OH 44114			EXAMINER ZERVIGON, RUDY	
			ART UNIT 1763	PAPER NUMBER
			MAIL DATE 08/23/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/702,368	Applicant(s) DIVERGILIO ET AL.	
	Examiner Rudy Zervigon	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 June 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 13-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 13-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>6/18/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. This application contains claims 26-29 drawn to an invention nonelected with traverse in Paper No. December 14, 2005. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 18-25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. Claims 18-25 recite the limitation "ion shower". There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
6. Claims 13-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weiler; Manfred et al. (WO 200163981 A)¹ in view of Moslehi; Mehrdad M. (US 5846883 A). Weiler teaches an ion shower system (Figure 1, Abstract), comprising: a plasma (Abstract) source (1-6; Figure 1, Abstract) operable to generate source gas ions within a chamber (7; Figure 1, Abstract),

¹ The Examiner has requested a translation of WO 200163981 A from the translations branch. While the request is being honored, USPat. 6,936,144 (citing WO 200163981 A as priority) is used as an aid in interpreting identically numbered elements.

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wherein the plasma (Abstract) source (1-6; Figure 1, Abstract) further comprises: a plurality of conductor segments (3; Figure 1, 2, 4; Abstract); an antenna drive circuit (8,2,9; Figure 1; Abstract) coupled to the plurality of conductor segments (3; Figure 1, 2, 4; Abstract), and operable to provide power to the conductor segments (3; Figure 1, 2, 4; Abstract); and a source gas inlet (6; Figure 1; Abstract), wherein the source gas inlet (6; Figure 1; Abstract) is operable to provide a source gas to the chamber (7; Figure 1, Abstract), and wherein the conductor segments (3; Figure 1, 2, 4; Abstract), antenna drive circuit (8,2,9; Figure 1; Abstract) cooperatively provide energy to charged particles in the chamber (7; Figure 1, Abstract), thereby energizing the charged particles and generating a plasma (Abstract) comprising source gas ions and electrons within the chamber (7; Figure 1, Abstract) to ionizing collisions between the energized charged particles and the source gas; an extraction assembly (5; Figure 1; Abstract) associated with the chamber (7; Figure 1, Abstract) and operable to extract source gas ions therefrom.

Weiler further teaches:

- i. The ion shower of claim 13, wherein first and last conductor segments (3; Figure 1, 2, 4; Abstract) of the plurality of conductor segments (3; Figure 1, 2, 4; Abstract) form an input, and wherein the antenna drive circuit (8,2,9; Figure 1; Abstract) is coupled to the input, as claimed by claim 15
- ii. The ion shower (Figure 1, Abstract) of claim 13, wherein the antenna drive circuit (8,2,9; Figure 1; Abstract) comprises an oscillator circuit (8,2,9; Figure 1; Abstract), as claimed by claim 18

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- iii. The ion shower (Figure 1, Abstract) of claim 18, wherein the oscillator circuit (8,2,9; Figure 1; Abstract) comprises a push-pull oscillator circuit (8,2,9; Figure 1; Abstract), as claimed by claim 19
- iv. The ion shower (Figure 1, Abstract) of claim 13, wherein the plurality of conductor segments (3; Figure 1, 2, 4; Abstract) are arranged within the chamber (7; Figure 1, Abstract) in an azimuthally symmetric fashion, wherein a non-uniform capacitive electrostatic field component along each conductor segment is repeated in an azimuthally symmetric fashion – claim 20
- v. The ion shower (Figure 1, Abstract) of claim 13, wherein the extraction assembly (5; Figure 1; Abstract) is associated with a top portion of the chamber (7; Figure 1, Abstract), and is operable to extract ions vertically from the top portion thereof, as claimed by claim 21
- vi. The ion shower (Figure 1, Abstract) of claim 13, wherein the chamber (7; Figure 1, Abstract) further comprises a bottom portion and side portions, and wherein the side portions comprise a plurality of multi-cusp magnet devices (4; Figure 1, Abstract) operable to produce multi-cusp magnetic fields thereat to facilitate an azimuthal uniformity of plasma (Abstract) within the chamber (7; Figure 1, Abstract), as claimed by claim 23
- vii. The ion shower (Figure 1, Abstract) of claim 23, wherein the multi-cusp magnet devices (4; Figure 1; Abstract) comprise electromagnets (4; Figure 1, Abstract)¹ operable to provide a variation in multi-cusp magnetic field strength at differing positions along the side portions, as claimed by claim 24

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- viii. The ion shower (Figure 1, Abstract) of claim 24, wherein the electromagnets are independently controllable, thereby facilitating a tuning of the multi-cusp magnetic fields, as claimed by claim 25

Weiler does not teach:

- i. a plurality of capacitors, wherein the conductor segments (3; Figure 1, 2, 4; Abstract) are serially connected through the plurality of capacitors, wherein the series arrangement of conductor segments (3; Figure 1, 2, 4; Abstract) and capacitors reside within the chamber (7; Figure 1, Abstract) – claim 13
- ii. The ion shower of claim 13, further comprising a workpiece support structure associated with the chamber (7; Figure 1, Abstract), and operable to secure the workpiece for implantation thereof of source gas ions from the extraction assembly (5; Figure 1; Abstract), as claimed by claim 14
- iii. The ion shower of claim 13, wherein the conductor segments (3; Figure 1, 2, 4; Abstract) have an inductive reactance associated therewith, and wherein the capacitors have a capacitive reactance associated therewith, and wherein one of the conductors and one of the capacitors form an antenna segment, wherein the inductive reactance and capacitive reactance of the antenna segment are equal at the predetermined frequency, as claimed by claim 16. Applicant's claim requirements of "the conductor segments have an inductive reactance associated therewith" is a recitation of inherency in of the prior art elements and Applicant's claimed subject matter. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977);

MPEP 2112.01). Further, Applicant's claim requirement of "wherein the inductive reactance and capacitive reactance of the antenna segment are equal at the predetermined frequency" is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

- iv. The ion shower of claim 13, wherein the plurality of conductor segments (3; Figure 1, 2, 4; Abstract) and plurality of capacitors form a resonant circuit (8,2,9; Figure 1; Abstract) at the predetermined frequency, as claimed by claim 17. Applicant's claim requirement of "form a resonant circuit at the predetermined frequency" is a claim requirement of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of

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performing the intended use, then it meets the claim (In re Casey, 152 USPQ 235 (CCPA 1967); In re Otto, 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

- v. The ion shower (Figure 1, Abstract) of claim 21, further comprising a workpiece support structure associated with the top portion of the chamber (7; Figure 1, Abstract), and operable to secure the workpiece having an implantation surface orientated facing downward toward the extraction assembly (5; Figure 1; Abstract) for implantation thereof, as claimed by claim 22

Moslehi teaches a plasma processing apparatus including a plurality of capacitors (356,358,360,362,364; Figure 9; column 15,16) and conductor segments (356,358,360,362,364; Figure 9; column 15,16), wherein the conductor segments ("antenna zones"; throughout) are serially connected through the plurality of capacitors (356,358,360,362,364; Figure 9; column 15,16). Moslehi further teaches a wafer support (Figure 11; not numbered).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Moslehi's serially located capacitors between Weiler's plurality of conductor segments (3; Figure 1, 2, 4; Abstract) and to add Moslehi's wafer support (Figure 11; not numbered).

Motivation to add Moslehi's serially located capacitors between Weiler's plurality of conductor segments (3; Figure 1, 2, 4; Abstract) and to add Moslehi's wafer support (Figure 11; not numbered) is for reducing induced RF voltages as taught by Moslehi (column 2; lines 20-30), and for supporting a desired article, respectively.

Response to Arguments

7. Applicant's arguments filed June 6, 2007 have been fully considered but they are not persuasive.

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8. Applicant's argument based on the Examiner's rejection under 112, 2nd paragraph of claims 18-25 is not persuasive. Correct antecedent basis in these claims would recite "ion shower system".

9. Applicant states:

"

Weiler discloses in Figs. 1 and 2a-2j (and corresponding text) a plasma source having a plasma excitation electrode. As shown in Figs. 2a-2j, the excitation electrode (that corresponds to the claimed conductor segment of claim 13 according to the Office Action) may comprise a single element or multiple segments. (See, e.g., Figs. 2e-2j). In instances where the excitation electrode consists of multiple segments, each segment or electrode is connected to its own separate matching network and its own separate high frequency generator. (See, e.g., Col. 4, lines 27-30). According to Weiler, connecting each electrode segment to its own separate power source (generator) is provided to generate different kinds of plasmas so as to control and adjust beam characteristics. (See, e.g., Col. 4, lines 30-33),

Therefore one of ordinary skill in the art would not be motivated to modify the multiple, isolated electrode segment configurations of Weiler by serially coupling such segments together via capacitors because doing so would contravene the intended purpose of Weiler, which was to separately drive each segment with its own power source to generate different plasmas and thus control and adjust beam characteristics. Therefore the requisite motivation to combine the cited art does not exist, and consequently the combination of Weiler and Moslehi is improper. Accordingly, withdrawal of the rejection is respectfully requested.

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“

10. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In particular, it is noted that when taking the references *as a whole* Moslehi also clearly supports the same objectives of Weiler in that Moslehi also teaches plural RF sources 1-3; Figure 9 and is thus consistent with Weiler's teachings.

11. Applicant states:

“

Claim 13 recites that the series arrangement of conductor segments and capacitors resides within the chamber. Even if a combination of Weiler and Moslehi were proper, the combination does not teach the invention of claim 1 for at least the following reasons.

Moslehi disclose a series combination of conductor segments and capacitors that is external to the chamber. (See, e.g., paragraph [0057], lines 15-21, and paragraph [0113], lines 6-9). Referring to Fig. 1 of Weiler, if one of ordinary skill in the art were to modify Weiler to add capacitor segments, the capacitors would most likely be coupled to the excitation electrodes 3 through the feedthroughs 9 near the matching network 2, and thus such capacitors would also be external to the outer chamber wall 7. One supporting rationale for locating such capacitor segments external to the chamber is that the magnetic field coils 4 are also located external to the chamber 7 via the contoured mounting element 1, as illustrated in Fig. 1. Further, no teaching exists within Weiler that would motivate one of ordinary skill in the art to locate the capacitor

segments within the chamber. Therefore a combination of the cited art does not result in the invention of claim 1. Accordingly, withdrawal of the rejection is respectfully requested.

“
In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In particular, it is noted that the Examiner's proposed combination states “It would ... to *add* Moslehi's serially located capacitors between Weiler's plurality of conductor segments (3; Figure 1, 2, 4; Abstract) and to add Moslehi's wafer support (Figuree 11; not numbered).”. Weiler's plurality of conductor segments (3; Figure 1, 2, 4; Abstract) already reside “in the chamber”.

Applicant states:

“
While conductor segments 186, 190 and 194 in Fig. 2 of Moslehi are arranged azimuthally, the capacitors that couple such segments together are not arranged in the azimuthally symmetric fashion as claimed. Rather, such capacitors follow the direction of the jumper water channels 214, 218, 226 and 230 illustrated in Fig. 2, and which is NOT azimuthally symmetric. Weiler does not remedy the deficiencies of Moslehi. In Figs. 2e-2j, none of the multiple conductor segment configurations are arranged azimuthally, and therefore a combination of the cited references does not result in the invention of claim 20, and therefore claim 20 is further non-obvious over the cited art. Accordingly, for at least this additional reason, withdrawal of the rejection is respectfully requested.

“

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). In particular, it is noted that the Examiner's proposed combination states “It would ... to *add* Moslehi's serially located capacitors between Weiler's plurality of conductor segments (3; Figure 1, 2, 4; Abstract) and to add Moslehi's wafer support (Figuree 11; not numbered).”. Weiler's plurality of conductor segments (3; Figure 1, 2, 4; Abstract) already “azimuthally symmetric”.

12. With respect to Applicant's position that Weiler does not teach the claimed “multi-cusp magnet” as electromagnets (4; Figure 1, Abstract)¹, the Examiner notes that the magnetic field in discussion is a function of Weiler's current process variable. When the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent (*In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01).

Conclusion


13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official fax phone number for the 1763 art unit is (571) 273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272-1435.


8/20/17